Conclusion

National forest land and communities in the Pacific Northwest are inextricably linked, now and into the future. With nearly half of the land base in Oregon and Washington under federal management, the infrastructure and opportunities provided by national forests, grasslands, national scenic areas or other Forest Service managed areas are never very far away. The Forest Service presence in the region, especially in rural communities, can provide important economic and social stability that extends beyond just the footprint of its offices and work centers.

The unique context of the region is a key factor in understanding where and how communities and the agency impact one another. The majority of the region's population resides in urban areas along the Interstate-5 corridor but Forest Service offices tend to be located in more rural areas. In these rural locations, some of whick lack much economic diversity, the Forest Service has a direct and measureable impact and the potential to contribute to economic stability and community capacity in the region. As shown in this book, the economic stimulus provided by the Forest Service can be through direct agency employment or additive effects, such as $581 million in sales of forest products to individuals and businesses throughout Washington and Oregon.

Even with a declining office presence over the years, the Forest Service maintains offices in some of the most rural places in the region, sometimes as the only tangible government office. This long-term presence helps to embed the Forest Service in these communities, which are often home to more vulnerable populations than other parts of the states. The higher than average proportions of individuals with disabilities and families with food stamps, combined with lower median incomes and lower owner-occupied housing rates all suggest towns and communities where social-economic wellbeing is fragile. These towns likely have a more difficult time preparing for, responding to or recovering from economic transitions such as forestry industry changes, or natural disasters such as wildfires or floods. All of this underscores the particularly influential stabilizing role the Forest Service can play in these areas, even as agency office presence declines.

Capacity of the Forest Service is directly tied to partners and cooperative efforts across the region, including the use of collaborative, cross-boundary initiatives and instruments. As Forest Service staff numbers continue to trend downward and budgets remain flat, restoration and management needs remain high. Partnerships and collaboration are critical for accomplishing work on the ground. Collaboration has deep roots in national forests and communities in Oregon and Washington, which is evident in the variety and number of forest collaboratives. The prevalence of collaborative projects under the Joint Chiefs' Landscape Restoration and Collaborative Forest Landscape Restoration programs are two examples of new ways of thinking and acting to manage forest lands across boundaries. Other instruments that encourage collaboration and cross-boundary work, such as stewardship contracting and Good Neighbor Authority, can also be seen in some of the spotlighted partnerships included in this book. Taken together, this diversity of collaborations and partnerships show how the region is using a suite of mechanisms to engage in collaborative and cross-boundary efforts to achieve restoration goals on forest lands and strengthen the human communities that depend upon the forests. The long-term presence the Forest Service has in these communities also allows for personal and institutional trust to be built, which is a precursor for these partnerships.

Communities interact with the Forest Service in a variety of ways. As we continue to demonstrate in the second year of this project, people and groups interact with the agency in a variety of ways, and from a diversity of venues. The agency works with a wide range of partners, from communities, to local and state governments, to nonprofits, collaboratives, schools, tribes, councils, small to large businesses, and individuals. At the same time, these partners engage in diverse activities with the Forest Service, bringing different resources and interests to the table. For example, some partners bring dollars, others bring crews to do work on the ground. Some partners focus on wildlife habitat restoration, others on educational forest activities, and others on their economic and/or cultural well-being through wood and other forest product purchases. These examples demonstrate just a few of the myriad ways in which the Forest Service partners with people across the region, to achieve shared social and ecological goals.

The Forest Service in the Pacific Northwest Region still has a large role to play in the region's natural and built communities. In the second year of this project, we chose depth over breadth, to dig deeper into questions and also show trends over time. This in-depth look allowed us to understand exactly where and how the agency is leveraging dollars to accomplish habitat restoration work on the ground. At the same time, this more comprehensive examination helped to emphasize key point: the Forest Service in the Pacific Northwest Region still has a large role to play in the region's natural and built communities. For every dollar or resource brought in by a partner, the agency matches the contribution several times over. The pace and scale needed for restoration across the region will continue to require the long-term and large scale commitment of resources that the Forest Service can provide. Although the agency experiences its own capacity constraints, the expertise of its staff, available resources, and institutional memory is critical for work on national forests and beyond.

As we look forward to the third and final year of this project, we hope to continue to identify, illustrate, and communicate the intricately intertwined connections between the Forest Service and communities in the Pacific Northwest Region.

Appendix: Methods and data sources

Introduction

Map p.4: Federal, state and tribal land designations

Data Sources:
USDA Forest Service Enterprise GIS, NOAA, Oregon Spatial Data Library, Washington State Geospatial Clearinghouse and ESRI.

Methods:
Map provided by US Forest Service September 18, 2017
Map edited by EWP for format and layout into book October 2017
Date originally created: 27 May 2017
Cartographer: Jesse Nett: jnett@fs.fed.us, Pacific Northwest Region, Data Resources Management

Maps p. 6: Distance to nearest hospital

Map p. 7: Drive time to the nearest interstate onramp

Also maps in distance and drive time map compendium to this book, available at http://ewp.uoregon.edu/USFScommunities

Data Sources:

- R6Hospitals.shp
  - Downloaded from: http://datawarehouse.hrsa.gov/tools/DataPortalResults.aspx
  - Name: Health Care Facilities (CMS)
  - Source: Health Resources and Services Administration Data Warehouse, US Dept of Health & Human Services
  - Downloaded by Greg FitzGerald on 5/15/2017
- USA Topographic Map
  - Added from ArcMap
  - Add Data -> Add Basemap -> Add USA Topo Map
- R6MajorCities.shp
  - Created from file provided by EWP and edited to contain four cities
- R6_interstate.shp
  - Provided by EWP
- Region6_outline.shp
  - Provided by EWP
- R6Highways.shp
  - Created from USA Major Highways file from ESRI
  - Downloaded from: http://www.arcgis.com/home/item.html?id=fc870766a3994111bce4a083413988e4
  - Selected: "HWY_TYPE" = 'U'
  - Cropped using Region6_outline.shp
- R6office.shp
  - Created from compiling data from documents provided by EWP and accessing Region 6 USFS website.
  - Created by Greg FitzGerald (EWP)

Methods:
Drivetime and distance surfaces were created in ArcMap 10.4 using the Network Analyst extension. The Network Dataset was created from the Esri's USA Major Highways layer. Before creating the Network Dataset a minutes column was added to the attribute table of the USA Highway Layer, and set equal to the Shape Length in Miles (this assumes 60 MPH travel time on each highway). Next, "Generate Service Areas" was used, using the facilities (Interstate, Banks and Hospitals, USFS Offices, Airports) and the network dataset. Other parameters included a snapping tolerance of 50 miles, and "MERGE" for polygon generation. The outputs of these analyses were clipped with the Region 6 Outline shapefile, before being merged with the region 6 outline. After merging, the values of "to_break" in OREGON and WASHINGTON were set to "121" to create a "more than 2 hours" travel time. For cartographic purposes, "Smooth Polygons" tool was used with a 10-mile value to round sharp edges in the drive times.

Chapter I: Where the Forest Service Works in Oregon and Washington	
Figures p. 10-11: Budget and personnel overview	**Data Source(s):** Budget: US Forest Service Region 6 (main contact: Biesecker, Emily J -FS ebiesecker@fs.fed.us) Report: Budget Status, Total Spent, Budget year 2016 USFS Removed Fire Suppression (WFSU) and Working Capital Fund (WCWC) spending from this analysis as both are managed at WO and/or ASC level of Forest Service. Personnel: US Forest Service Region 6 (main contact: Biesecker, Emily J, ebiesecker@fs.fed.us); Report: WorkPlan Personnel Planned Cost Details Sum of Planned days, divided by 260 day work-year, FY 2016 Forest Service acreage: Forest Service Land Area, 2016 **Methods:** Summary tables were created in Excel. Pie charts showing each forest unit in the unit (p. 10) were created in Adobe Illustrator using Pie Chart Tool. Circles on p.11 scaled according to relative size based on area using Adobe Illustrator Pie Chart Tool
Figures p. 12-13: Budget and personnel trends across the region and by national forest	**Data Source(s):** Budget: US Forest Service Region 6 (main contact: Biesecker, Emily J -FS ebiesecker@fs.fed.us) Report: Budget Status, Total Spent, begin budget year (-10) USFS Removed Fire Suppression (WFSU) and Working Capital Fund (WCWC) spending from this analysis as both are managed at WO and/or ASC level of Forest Service. Personnel: US Forest Service Region 6 (main contact: Biesecker, Emily J, ebiesecker@fs.fed.us); Report: WorkPlan Personnel Planned Cost Details Sum of Planned days, divided by 260 day work-year **Methods:** Summary tables were created in Excel; Trend graphs were created in Adobe Illustrator using Line Graph Tool
Map p. 14: Oregon and Washington office locations	**Data Source:** USFS offices were provided by US Forest Service Region 6 (main contact: Biesecker, Emily J, ebiesecker@fs.fed.us) **Methods:** Offices were checked through Region 6 website. Dataset contains every US Forest Office location with address, assigned coordinates to each location. R6office.shp was created for office locations in the region.
Figure p. 15: Office locations and town sizes	**Data Sources:** Office location: USFS offices were provided by US Forest Service Region 6 (main contact: Biesecker, Emily J -FS ebiesecker@fs.fed.us) 2015 Population data: Accessed on: July 8th 2017 Data from 2015 American Community Survey 5-year Population Estimate https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml **Methods:** Dataset contains every US Forest Office location with address, assigned coordinates to each location. Statistics pertain to city where office is located. Linked Census data on city population to each listed city. If data for city name was unavailable, zip code of city was used instead. Cities where data at town level was unavailable (zip code used instead): Chemult OR, Randle WA, Quinault WA, Leavenworth WA, Crescent OR, Silver Lake OR, Curlew WA, Zigzag OR, Tiller OR, Idleyld Park OR Blank occurrences in data where data was unavailable are reported with footnotes.

Figures p. 16-17: Characteristics of towns where the Forest Service Works	**Data Sources:**
	Office locations: see Map p.14 info
	Demographic data: US Census and American Community Survey.
	▪ Percent Graduated High School and Veterans
	  ▪ Accessed on July 10th 2017
	  ▪ Data from 2011-2015 American Community Survey 5-Year Estimates
	  ▪ https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml
	▪ Top Industries, Median Household Income and Reported Ethnicities (Excluded Caucasian)
	  ▪ Accessed on July 14th 2017 - July 18th 2017
	  ▪ Data from 2011-2015 American Community Survey 5-Year Estimates
	  ▪ https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml
	
	Methods:
	Data was downloaded from American Fact Finder based on the city where Forest Service offices are located. When data was unavailable at the city level, zip code for the Forest Service office was used instead (Chemult OR, Randle WA, Quinault OR, Leavenworth WA, Crescent OR, Silver Lake OR, Curlew WA, Zigzag OR, Tiller OR, Idleyld Park OR). Census data was linked to each city with a USFS office
	All variables were categorized into unique bins in order to effectively display variation in the variable; individual bar charts, pic charts and a scatterplot of all variables was constructed. Where scaled circles were used, circles were scaled to the number of towns within each corresponding category.

Map p. 18: Forest Service office locations and county populations	**Data Sources:** US Department of Agriculture, Economic Research Service's (ERS) Rural-Urban Continuum Codes (2013). Accessed September 2017 https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/ **Methods:** Mapped all counties with USFS offices located in them, shaded counties according to classification in the metro-non metro county population data. From ERS: "ERS' 2013 Rural-Urban Continuum Codes form a classification scheme that distinguishes metropolitan (metro) counties by the population size of their metro area, and nonmetropolitan (nonmetro) counties by degree of urbanization and adjacency to a metro area or areas."
Figure p. 19, scatterplots: Forest Service office locations and county populations	**Data Sources:** Office location: see Map p. 14 info Metro-non-metro town designations: assigned each town to its respective county population category as shown on Map on p. 19 (previous page). Collapsed the nine population categories into metro and non metro. Demographic data: US Census and American Community Survey. ▪ Accessed September 2017 ▪ Data from 2011-2015 American Community Survey 5-Year Estimates ▪ https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml **Methods:** Data was downloaded from American Fact Finder based on the city where Forest Service offices are located. When data was unavailable at the city level, zip code for the Forest Service office was used instead (Chemult OR, Randle WA, Quinault OR, Leavenworth WA, Crescent OR, Silver Lake OR, Curlew WA, Zigzag OR, Tiller OR, Idleyld Park OR). Census data was linked to each city with a USFS office All variables were categorized into unique bins in order to effectively display variation in the variable; scatterplots of all variables were constructed.

Chapter II: Landscape Restoration Through Collaboration	
Maps and figures p. 22-25: Forest collaborative groups	**Data Sources:** Shapefiles of forest collaborative boundaries provided by forest collaboratives, either as actual shapefiles, or as descriptions (e.g. "XX watershed). Office locations provided by forest collaboratives. Other collaborative details, such as year collaborative began, and public or all-lands focused is stored and updated annually in a database maintained by Ecosystem Workforce Program, University of Oregon, and informed by data from Dr. Emily Jane Davis at Oregon State University, as well as direct communication and verification with forest collaboratives.
Map and figures p. 26-27: Collaborative Forest Landscape Restoration projects	**Data sources:** https://www.fs.fed.us/restoration/CFLRP/index.shtml Shapefiles: https://data.fs.usda.gov/geodata/edw/datasets.php?xmlKeyword=CFLRP (main contact: Buchanan, Lindsay S -FS lindsaysbuchanan@fs.fed.us) **Methods:** Totaled acres in projects, and dollars invested by category. Reduced list of 156 project partners to 134 unique organizations (some organizations work on more than one project). Then coded project partners by organization type (e.g. non profit, city/local government, school district, ect). Reported organization by coded partner type.
Map and figures p. 28-29: Joint Chief's Landscape Restoration Projects	**Data sources:** Funding and project reports from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/features/?cid=stelprdb1244394 Shapefiles: Forest Service Region 6 and National Forest staff related to Joint Chiefs' projects provided forets by forest project shapefiles (main contact: Maia Enzer, mjenzer@fs.fed.us) **Methods:** Totaled dollars invested by category. Reduced list of 73 project partners to 48 unique organizations (some organizations work on more than one project). Then coded project partners by organization type (e.g. non profit, city/local government, school district, ect). Reported organization by coded partner type.

Chapter III: Partnership Spotlights	
Terrestrial Habitat Enhancement Section; p. 32-36	**Data Source:** The Terrestrial Habitat Enhancement database was obtained directly from the Forest Service, covering FY2014 – FY2016 on May 31, 2017. Contact information: Data provided by: Josh Chapman, Region 6 Wildlife Program Lead (joshuachapman@fs.fed.us).
Figure p. 32: Combined budget	**Data Source:** see Terrestrial habitat enhancement data source section above **Methods:** ▪ Terrestrial Habitat Enhancement data files were in the form of shapefiles. Associated attribute data stored with spatial information were extracted and converted to Excel files for summation. ▪ Each fiscal year files were then joined together to great a master summary page. We added a column to denote the fiscal year for easier sorting. Summaries were generally calculated using the pivot table tool. ▪ To create the figure, we summarized "Activity_T" column for the inner circle that is more general and the linked those activities with fine-scale, in-field restoration activities described in "Activity_1" column to make the outer arcs of the figure. We used funds reported in "BLI_Funded" column for both summations. ▪ To simplify the figure for greater clarity, we generalized the many in-field restoration activities into more generalized categories (e.g. we described road decommissioning as one category when it is recorded in five different treatment levels).
Figures p. 33: Acres restored total and by FY and type of restoration activities	**Data Source**: see Terrestrial habitat enhancement data source section above **Methods:** ▪ Same general process as described in Fig. 3.1 ▪ We summarized FY 2014-2016 restoration activities, using "Activity_T" and "Acres_BLI" columns for the pie chart, and then removed those activities that accounted for less than 1% for clarity. ▪ We repeated the above steps for the stacked column figure for each fiscal year using "FY" column. ▪ We calculated acres burned from natural wildfire and prescribed fire for each fiscal year using "Fuel" from the "Activity_T" and then "prescribed fire or wildlife natural or other fuel treatment" in the "Activity_1" column. We then linked these categories with "Acres_BLI."
Figures p. 34: Total Forest Service and Partner contributions per FY; Restoration Activities invested in by parters	**Data Source:** see Terrestrial habitat enhancement data source section above **Methods:** ▪ Same general process as described in Fig. 3.1 ▪ For the stacked column budget figure, we summarized Forest Service and partner contributions for FY 2014-2016 using "FY" column to organize totals by year, and "BLI_Partner" column, which denotes a "Y" if a partner was involved in the project or a "N" if it was a Forest Service project. We summed totals using "BLI_Funded" column. ▪ We calculated the acres partners help restore by sorting the "Acres_BLI" column with "BLI_Partner" column to determine if a partner was involved. Then we linked "Activity_T" categories with the partner-only funded projects.
Figure p. 35: Partner types and number and type of partner by forest	**Data Source:** see Terrestrial habitat enhancement data source section above **Methods:** ▪ We categorized 99 partner organization from this dataset into six categories. At the higher level of organization, we labeled partners: business or utility, education, government, nonprofit, tribe, or watershed council or conservation districts. We lumped city, county, state and federal partners into a generic "government" category for simplicity and to be able to visualize the partner contributions more clearly. Universities/colleges and K-12 school districts were similarly pooled together into an "education" partners grouping. Tribal owned entities were also grouped with "tribes." We excluded "individuals" from the partner list to focus on organizational level partnerships with the Forest Service. ▪ To make the partner-restoration activity "donut" figures, we used the above partner categories and calculated the financial investments for each of these six groups using the partner type and values from the "BLI_Funded" column and "Activity_T" categories. ▪ We added the number and type of partners (using above categories) by forest or scenic area to create the stacked column figure.

Map p.36: Terrestrial Habitat Enhancement partnerships leveraged by forest	**Data Source:** see Terrestrial habitat enhancement data source section above **Methods:** ▪ For each forest, we calculated the total FY 2014-2016 budgets for the Terrestrial Habitat Enhancement program. We linked "BLI_Partner" column, which denotes a "Y" or "N"if a partner was involved. We used the partner participation column to divide total budgets into Forest Service and partner contributions, using "BLI_Funded" column for each forest.

National Forest Product Partners Section; p. 38-43	**Data Source:**
	TIM data was obtained directly from the Forest Service, covering FY2002 – FY2016. Data provided by: Dana Croll, Regional TIM Coordinator (dcroll@fs.fed.us). Reports used were all excel (.xlsx) and included:
	▪ Region6BiddersFY02-16 (Obtained January 20, 2017)
	▪ Region6DataFY02-16 (Obtained January 20, 2017)
	▪ Regio6ProdUOMDescriptionQuantityFY02-16 (Obtained January 20, 2017)
	▪ ContractType2003through2016 (Obtained October 13, 2017)
	
	Methods:
	▪ Analysis: Timber sales were aggregated by year from FY2003 – FY2016. FY2002 was excluded, as this was the first year the Forest Service reported timber sales in the TIM database, and data for this year appeared incomplete.
	▪ Products were categorized as follows:
	  ▪ Sawtimber: saw timber
	  ▪ Nonsaw: Cull Logs, Dry Biomass Converted, Fuelwood, Green Biomass Converted, Miscellaneous-Converted, Non-Saw, Poles, Pulpwood
	  ▪ Non-timber Forest Products: Cones-Dry, Cones-Green, Foliage, Grass, Limb/Bough, Mushrooms, Non-Converted, Transplant, Xmas Trees
	▪ We totaled the number of sales in each category above by year. We looked at sales by purchaser, and categorized the 826 separate purchasers into one of 7 categories:
	  ▪ Sawtimber only (223)
	  ▪ Nonsaw only (147)
	  ▪ Non-timber forest products only (208)
	  ▪ Sawtimber and Nonsaw purchasers (239)
	  ▪ Sawtimber and NTFP purchasers (2)
	  ▪ Nonsaw and NTFP purchasers (1)
	  ▪ Purchasers of all 3 types of products (6)
	▪ For analysis purposes, we focused on the four categories with the largest number of purchasers. Purchasers were mapped using ArcMap10.4 based on their zip code.